



Medical School Hotline

Technology and the Problem Based Learning (PBL) Curriculum at the John A. Burns School of Medicine

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Since the transition to a problem-based learning (PBL) curriculum in 1989, the John A. Burns School of Medicine (JABSOM) has continued its tradition of innovation in medical education. By developing the necessary collaborations, infrastructure, faculty, and personnel, JABSOM is creating a critical mass of education technology projects that will be self-sustaining. These projects have been made possible through sponsoring grant-funded research and service initiatives. One example is a Web-based curriculum portal that has been created for students to access on-line supplemental medical education resources, and to enter "learning issues" generated during their studies of the core PBL curriculum.¹ A second project is developing a virtual reality patient simulator that permits students to interact and treat the patient in the heretofore paper-based healthcare problems.² A third project involves the creation of an entirely Web-based curriculum to teach students and practitioners the principles and practice of telemedicine.³ Through yet another grant, a state-wide network of video conferencing units has been established to facilitate distance learning so that students at rural training sites can participate in Manoa-based tutorial groups.⁴

Each project has accomplished its objectives. These projects, and other technology-focused projects have succeeded as individual projects and contribute to the development of a cohesive, self-sustaining core of technology-enhanced educational tools for JABSOM and PBL. Currently, faculty at JABSOM are continuing the development of new and innovative education technology projects with an eye to create a self-sustaining, resource-sharing, innovative environment for medical education facilitated by technology.

In addition to the many projects developing new education technologies, JABSOM students enjoy the established technology resources aimed to enhance the PBL curriculum. A Learning Resource Center houses over 15 computers for student use. The computers are loaded with medical education software to supplement instructions in anatomy, pharmacology, pathology, and many other disciplines. In addition, the Hawaii Medical Library and JABSOM library provide computers for students to perform literature and database searches. The Hawaii Medical Library maintains websites and provides training on the use of personal digital assistants for medical reference. Both libraries provide training for students to effectively utilize computers in conducting searches in the medical literature and national databases. All of these activities have contributed to the growth in the effort to provide technological tools to enhance student education.

An essential part of the development of medical education en-

hanced by information technology is the formation of a new office at JABSOM. In November 2002, an Office of Information Technology (OIT) was established within JABSOM. OIT's focus is to provide cohesive, responsive and strategic Information Technology (IT) support to JABSOM, based upon industry standards and best practices. The focus will be to observe the needs of faculty, students, researchers and administrators. OIT's plans are to develop a formal technology support organization that will consist of a director, network engineers, web/application developers, project managers, analysts, and help desk support staff. OIT will provide support for PBL programs, including ongoing support for PBL grant-initiated projects even when grant funding is no longer available. This institutional support will allow individual departments and research projects to leverage IT resources and avoid duplicative infrastructure development.

The Office of Information Technology is also focused on developing infrastructure. The Biomedical Sciences Building on the University of Hawaii, Manoa campus, which currently is home to the John A. Burns School of Medicine, was built in 1980. The building's network is being upgraded for better access to information resources by retrofitting and installing new conduits in this old building. A new medical school campus is scheduled for completion in mid-2005. A major task of the OIT is to plan the technology infrastructure of this new structure. The technology infrastructure will be based on the latest Cisco network architecture with an external link to INet, a high-speed telecommunications network that serves educational facilities throughout Hawaii. JABSOM faculty and students will have access to a Voice-over IP, video and data network via fast Ethernet, wired connections or wireless LANs. Wireless access points will be located throughout the campus, including classrooms, study areas, dining areas, and laboratory spaces. Secured file server rooms (with fiber-optic feeds) will provide hosting services to JABSOM applications and databases, and include Web-based services. This state of the art infrastructure will provide all JABSOM students, faculty, and staff with ready access to technology tools and resources to enrich further the PBL program.

The new home of JABSOM will include a simulation center and enhanced distance education capabilities. The center will provide hands-on learning and practice with simulated patients (both real and virtual), and allow students and other trainees to practice with instruments for invasive procedures (also both real and virtual). An Intranet will be created, with interactive databases to support information access by students and faculty. Distance education and the Intranet will minimize geographic and temporal boundaries inherent in a community-based medical school, where students accomplish their training in small groups, at multiple sites. These technologies will maximize curricular content delivery and further enable interaction with basic scientists and clinicians.

The incorporation of technology in medical education and PBL provides students with access to the most current information and allows a greatly enhanced level of interactivity with course material. Interaction with technology also prepares students for practicing medicine in today's healthcare environment. Proficiency with electronic information retrieval, Internet use, and interaction with

Continued on p. 65



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"Medical School Hotline," continued from p. 59

technological developments such as telemedicine, examinations such as virtual colonoscopy, and augmented reality, are essential to the practice of medicine in the near future. In addition, the use of technology in the PBL curriculum will provide timely data streams to and from students for administrative purposes. Changes to the curriculum will be transmitted efficiently and allow educators to be more responsive to students' needs. This improved data acquisition will provide Office of Medical Education with accurate and timely data for reporting to accrediting bodies.

Technology teaching tools and networks at JABSOM are occurring within the environment of the worldwide community of medical education as well as within the local Hawaii community. Faculty at JABSOM are partnering with faculty at medical schools around the world to develop innovative teaching methods that employ technology. Faculty are also collaborating with local and federal organizations in pursuit of research agendas to investigate the promises of technology in medical education, research, and clinical care. JABSOM is committed to adopting technology to enhance the delivery of its mission. Using its innovative approaches in medical education that includes technology and problem-based learning, JABSOM will educate students to become outstanding physicians, scientists and other healthcare professionals and to conduct research and provide community service in areas of specific interest to the Asia-Pacific region and community.

References

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